

# Categorical Use Attainability Analysis for Recreation

Designation of Streams for  
Secondary Contact Recreation



Public Outreach  
August 2013

# Outline

- Background on Recreation Designated Uses
- EPA Disapprovals
- Categorical UAA for Recreation
- Web Map Tutorial
- Feedback



# Clean Water Act and Recreation



- Clean Water Act Section 101(a): requires, where attainable, water quality providing for the protection and propagation of fish, shellfish and wildlife, and recreation in and on the water
- Section 101(a) establishes a “rebuttable presumption” that the fishable/swimmable (primary contact recreation) uses are attainable and must be designated on all waters, unless state demonstrates that use is not attainable



My Clean Water Act



# Primary Contact Recreation



## Chapter 1 Definition:

- Any recreational or other surface water use that could be expected to result in ***ingestion*** of the water or ***immersion*** (full body contact)



- Full body contact waters: larger streams, rivers, lakes
- Ingestion waters: streams, rivers, creeks of any size located in areas easily accessed by children and/or the public
- Maintain water quality safe for human contact

# Recreation Designated Uses in WY



- Wyoming has primary contact recreation and secondary contact recreation designated uses and summer recreation season
- During the 2007 revision of Chapter 1, Section 27, *E.coli*, designated all waters in Table A of *Surface Water Classification* List for primary contact recreation
- All other waters were designated for secondary contact recreation
- EPA disapproved because no use attainability analysis (UAA) had been conducted
- Federal and state regulations require a UAA to remove primary contact recreation use





# Use Attainability Analyses

- Use attainability analysis is a structured scientific assessment of the factors affecting the attainment of use
- There are “six factors” that you can use to remove fishable/swimmable uses
- Factors are physical, chemical, biologic, or economic



# Use Attainability Analyses Factors



## Chapter 1, Section 33 (b)

- (i) Naturally occurring pollutant concentrations prevent the attainment of the classification or use; or
- (ii) Natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating state water conservation requirements to enable uses to be met; or
- (iii) Human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place; or
- (iv) Dams, diversions, or other types of hydrologic modifications preclude the attainment of the classification or use, and it is not feasible to restore the water body to its original condition or to operate such modification in such a way that would result in the attainment of the classification or use; or
- (v) Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of the classification or use; or
- (vi) Controls more stringent than those required by Sections 301(b) and 306 of the Federal Act would result in substantial and widespread economic and social impact. This subsection shall not apply to the derivation of site-specific criteria.

# EPA Disapprovals



- To address the disapproval, EPA recommended removing the language in Chapter 1
  - If approved by the governor, Chapter 1 will designate all waters for primary contact recreation except those designated for secondary contact recreation through a UAA



- To change waters to secondary contact recreation, EPA recommended doing site-specific UAAs or a categorical UAA



# Categorical UAA for Recreation



- Categorical statewide UAA is the best approach given the large public interest in designating streams for secondary contact recreation
- Statewide UAA recognizes that the state has many waters that are not used for or do not support primary contact recreation (Wyoming is the 3<sup>rd</sup> driest and least populous state in the U.S.)
- WDEQ has limited staff and resources and changing individual stream segments through UAAs is resource intensive



# Timeline

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- April 2009: With assistance from USFS and WACD, WDEQ began development of categorical UAA
- Sum/Fall 2010: WACD and districts conducted ~800 field verification site visits; WDEQ conducted surveys at ~150 sites
- Feb. 8, 2012: WDEQ sent EPA a draft of the UAA; EPA consulted with EPA Headquarters and other EPA Regions
- May 15, 2012: EPA sent comment letter to WDEQ on draft UAA; main concern was how the UAA showed that primary contact recreation was not attainable based on one of the six factors (e.g., low flow)
- June 26, 2012: WDEQ and EPA met to discuss UAA; WDEQ weighed options; EPA recommended potentially using NHDPlus for identification of low flow streams

# Timeline

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Oct. 10, 2012: WDEQ submitted Identification of Low Flow Streams approach to EPA for review; EPA has had discussions with EPA Headquarters, other EPA Regions that have done recreation UAAs

Jan. 22, 2013: EPA sent response on Low Flow approach – preliminary thinking is that approach will fulfill the regulatory requirements of 131.10(g)

Spring 2013: Incorporated NHDPlus Version 2 Flow Scrutinized UAA Access Layers

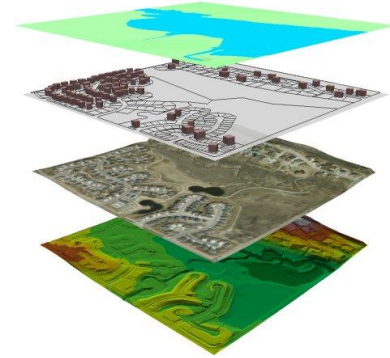
August 2013: Draft of UAA Released for Public Comment



# General Approach of UAA



- Geographic Information System (GIS) Based
- 100,000 (100k) National Hydrography Dataset (NHD) streams is the foundation
- Streams are identified as primary or secondary based on:
  - Low flow (UAA factor 2)
  - Access: proximity to areas frequented by children and/or the public
  - Public Feedback





# Low Flow Streams

- Identify streams without enough flow to support primary contact recreation
- Most other states that have used “low flow” factor used depth measurements (mean depth of 0.5 meter, max depth of 1 meter)
- UAA uses modeled mean annual flow for streams from NHDPlus
- NHDPlus is a data set that can be added to 100k NHD
- Mean annual flow is average of all daily flows



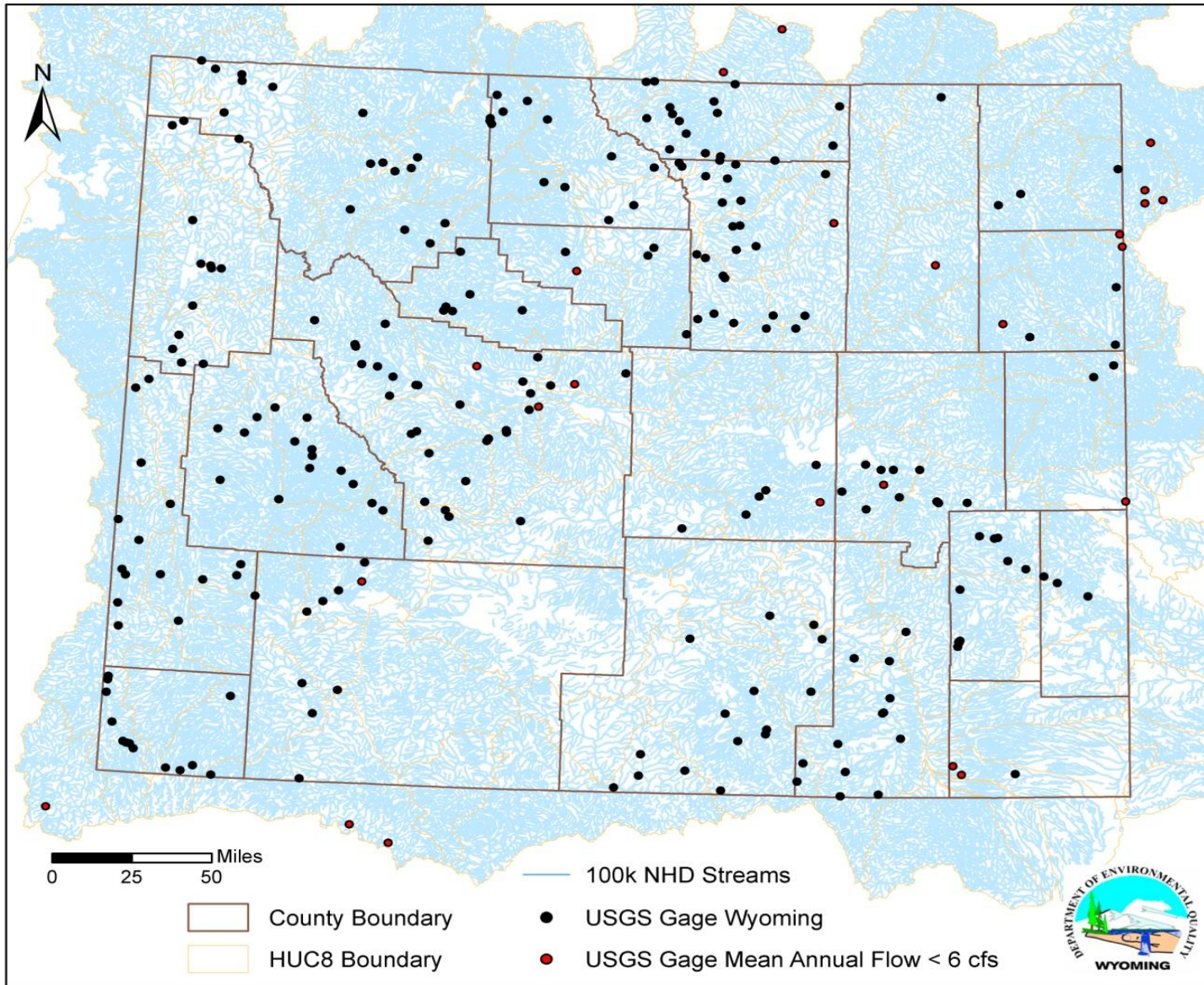
# Low Flow Approach

- In Wyoming, ephemeral, small intermittent, and small perennial streams will definitely not have sufficient flow to support primary contact recreation
- To identify these streams, compared mean annual flows of 257 USGS gage sites in Wyoming to mean recreation season flows

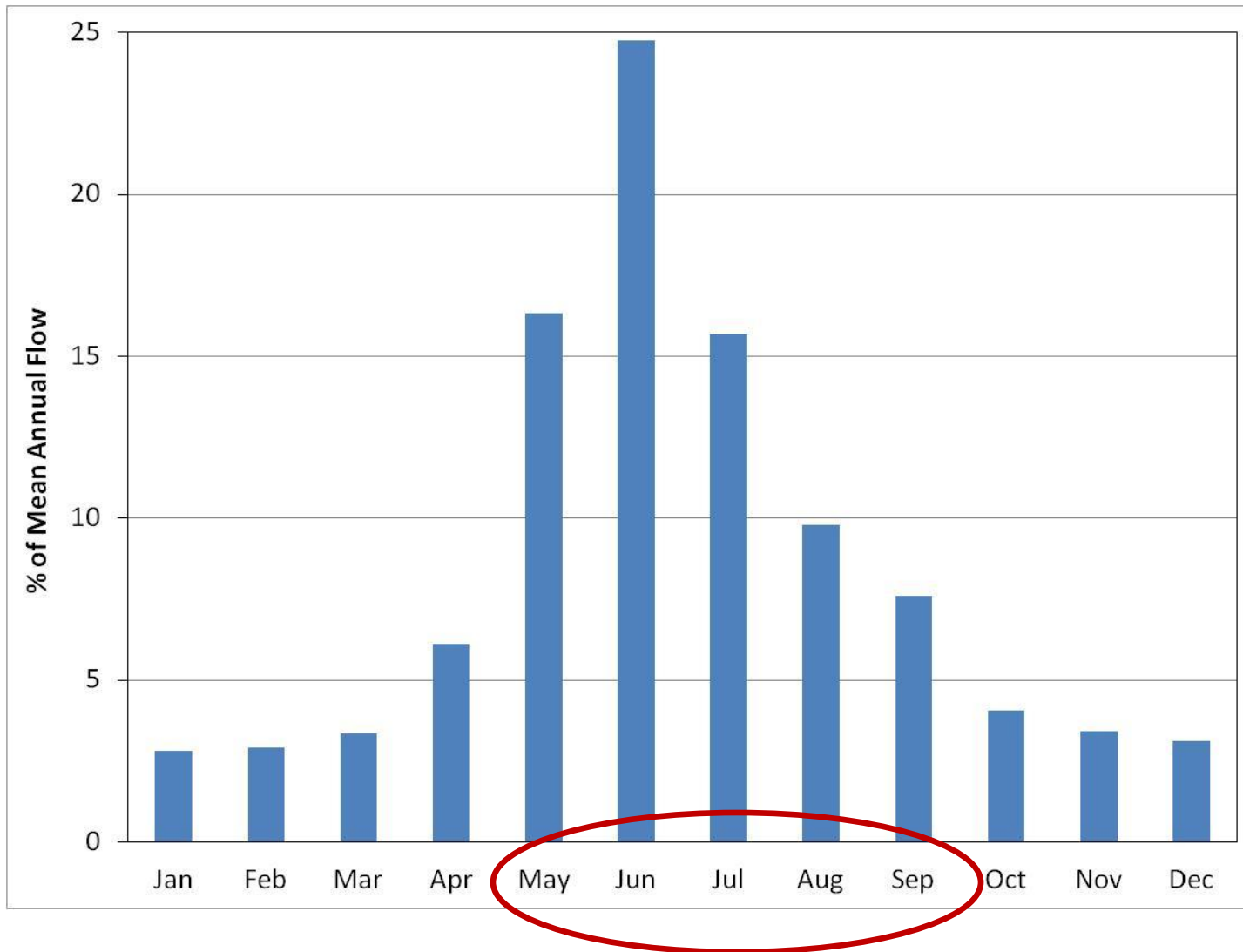




# Low Flow Approach



# Low Flow Approach



Large Perennial  
Streams

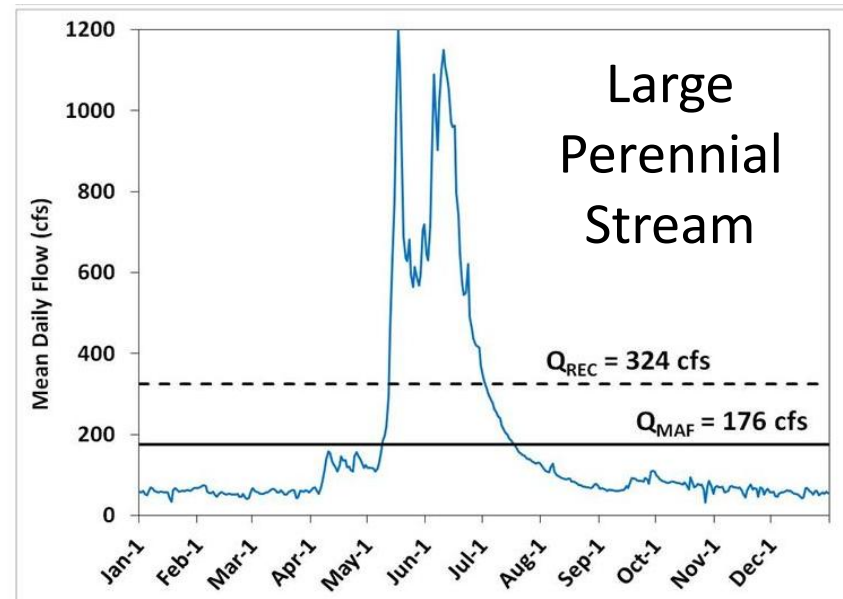
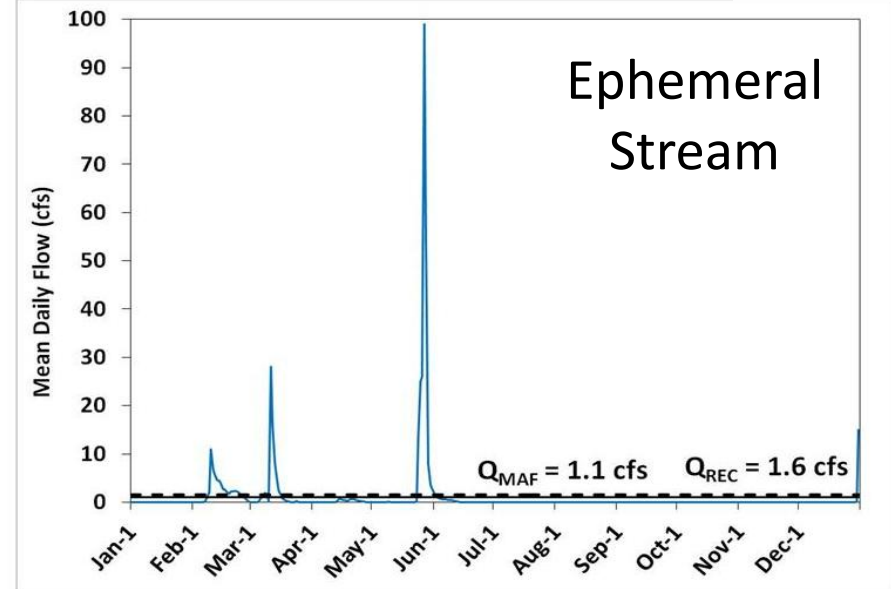
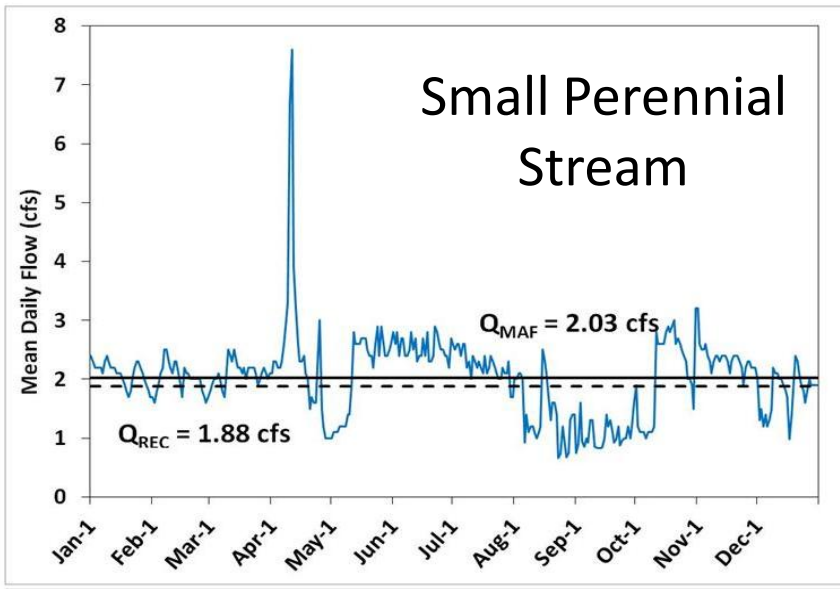
$$Q_{\text{REC}} > Q_{\text{MAF}}$$

Ephemeral,  
Small  
Intermittent,  
Small Perennial  
Streams

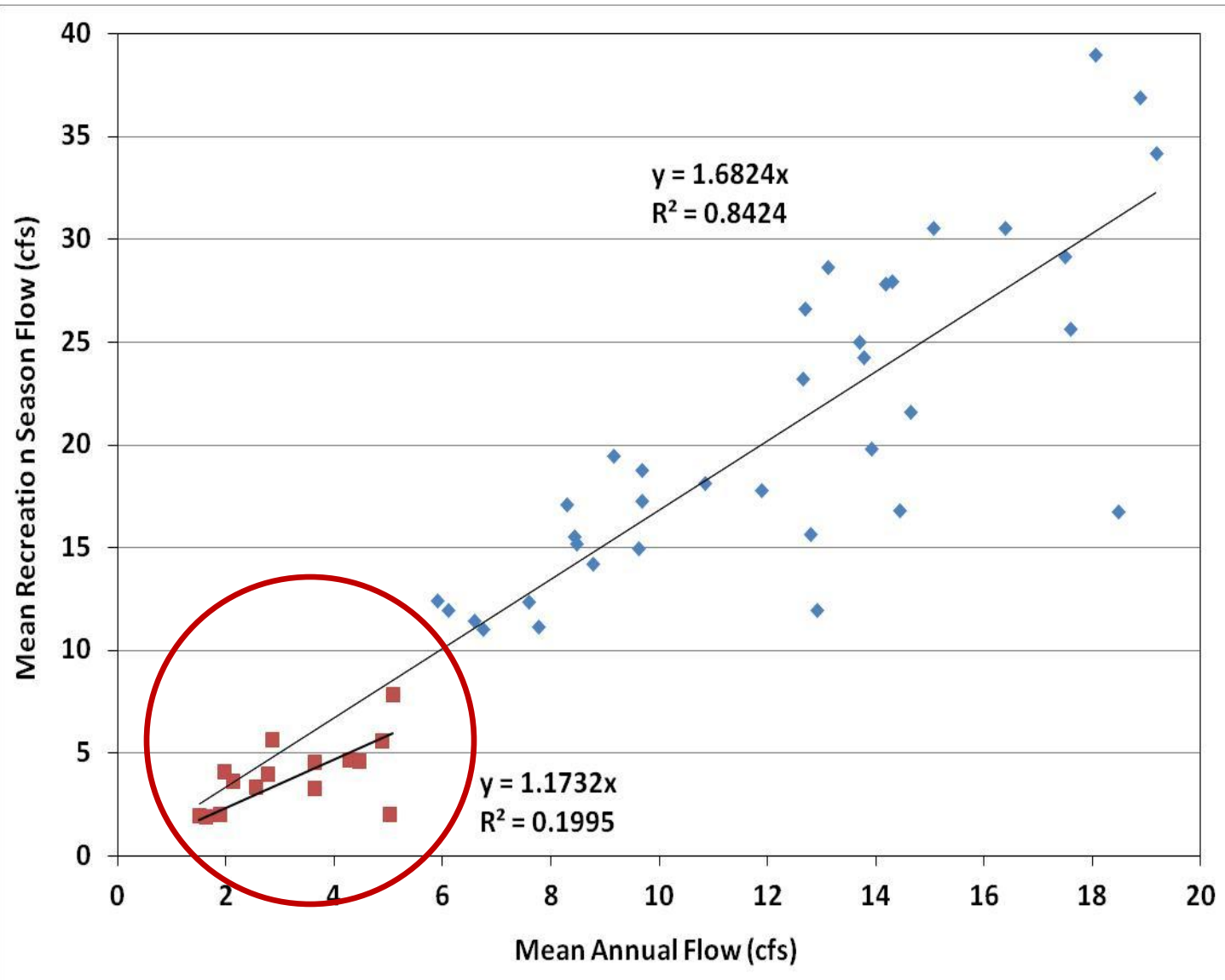
$$Q_{\text{REC}} \approx Q_{\text{MAF}}$$



# Low Flow Approach



# Low Flow Approach



$$\text{MAF} \geq 6 \text{ cfs}$$
$$Q_{\text{REC}} = 1.7 * Q_{\text{MAF}}$$

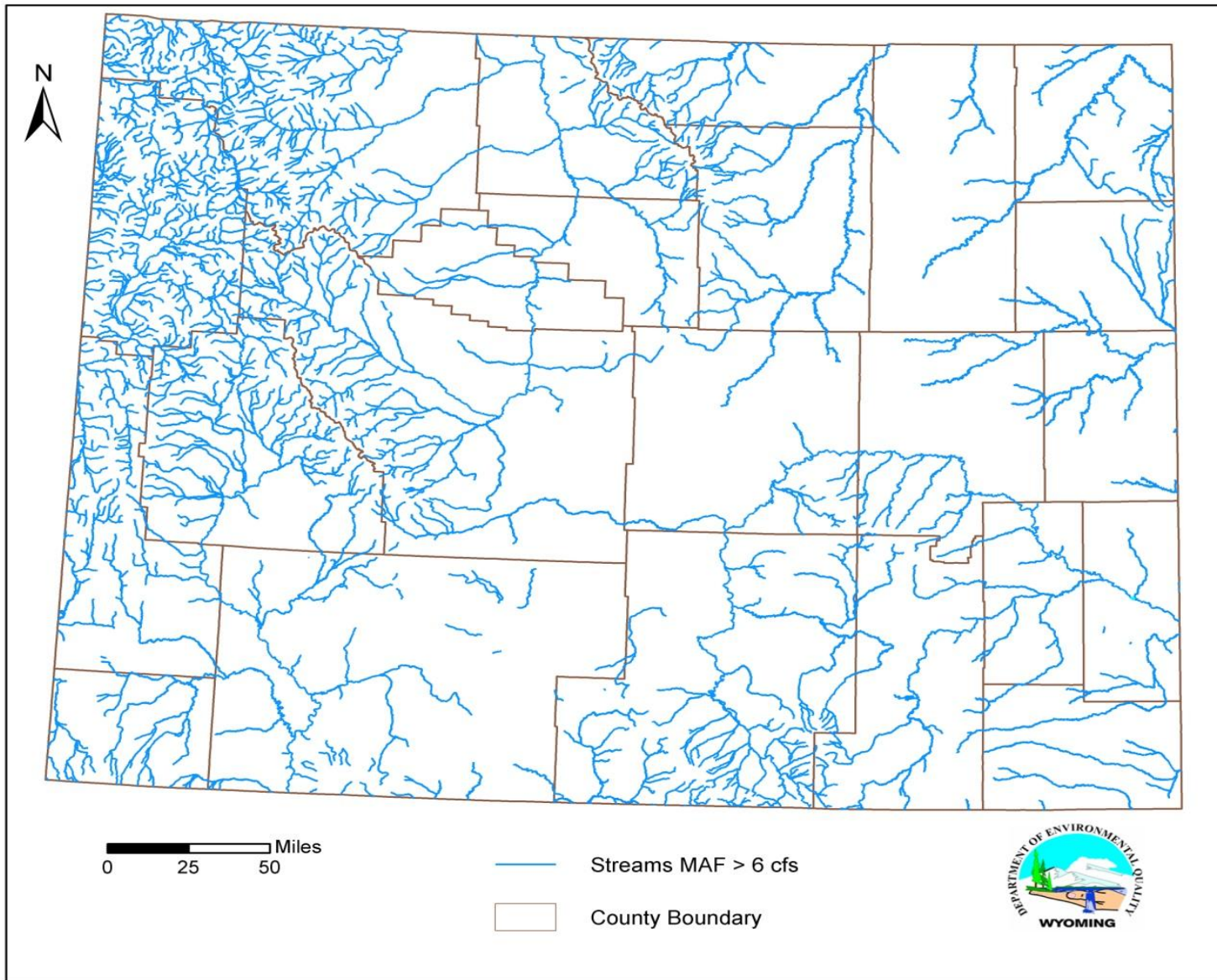
$$\text{MAF} < 6 \text{ cfs}$$
$$Q_{\text{REC}} = 1.2 * Q_{\text{MAF}}$$

# Low Flow Approach

- For gage sites with mean annual flows less than 6 cfs, mean annual flows and mean recreation season flows were similar
- Streams with MAFs  $< 6$  cfs represent ephemeral, small intermittent, and small perennial streams
- Ephemeral, small intermittent, and small perennial streams do not have sufficient flow to support primary contact recreation (immersion activities)
- Validation
  - Mean depth at USGS gage sites with MAF  $< 6$  cfs ranged from 0.4 to 0.8 feet
- Validation: Photos



# Low Flow Approach



Based on  
mileage,  
~82.2% of  
100k NHD  
streams  
have MAF <  
6 cfs

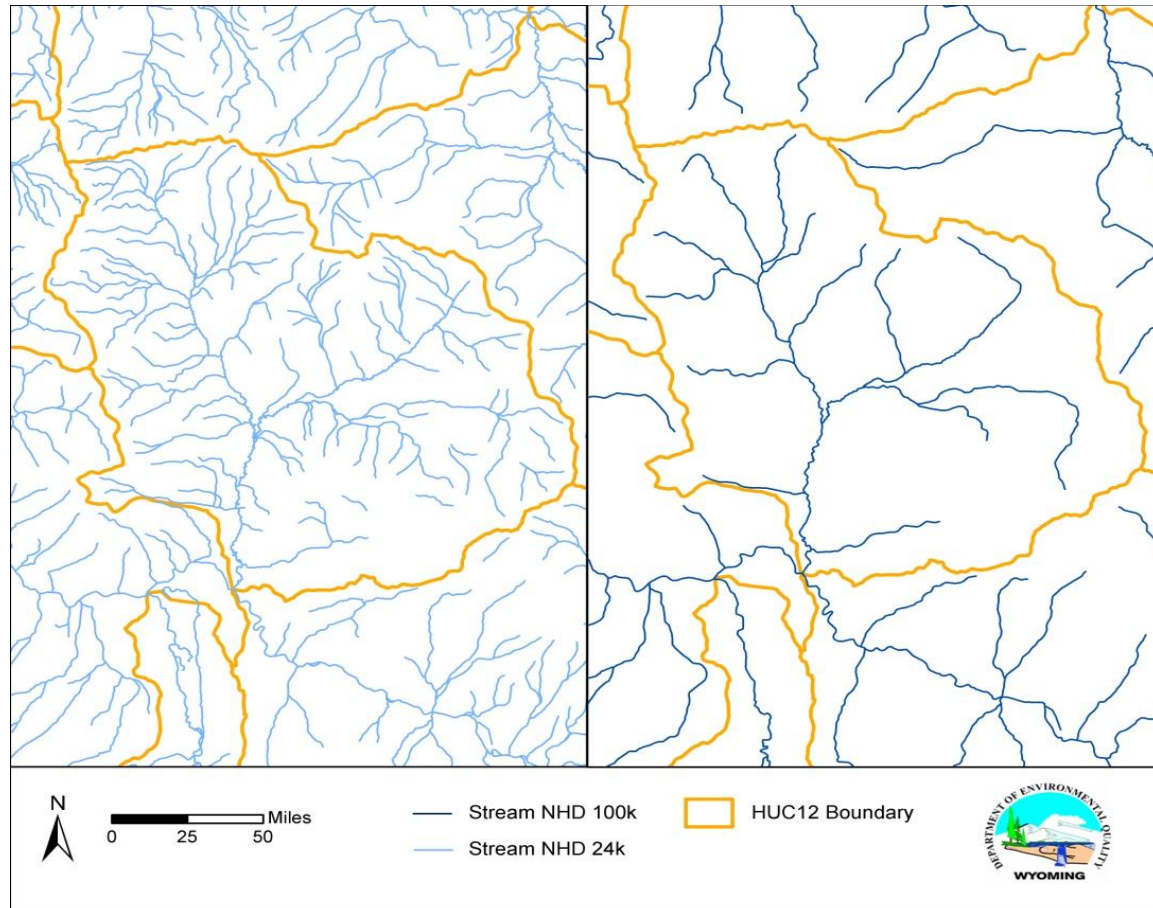
Expect that  
site specific  
UAAs will  
occur



# Mean Annual Flow of 24k Streams



- MAF estimates only available for 100k NHD
- To include all streams as part of UAA, extrapolated flow to 24k NHD
- Streams not present in the 100k NHD, but present in the 24k will generally be isolated segments and tributaries to 1<sup>st</sup> order streams
- 1<sup>st</sup> order streams in 100k NHD have:
  - Mean: 1.1 cfs
  - Median: 0.2 cfs
  - 95<sup>th</sup> %: 4.8 cfs



- Mean annual flow of 24k streams are less than 6 cfs, so do not support primary contact recreation

# Access Criteria

Populated Places

Schools

Campgrounds

State Parks

National Parks

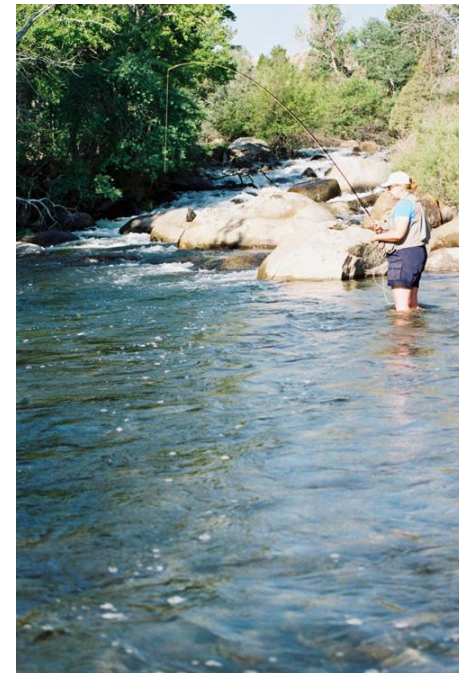
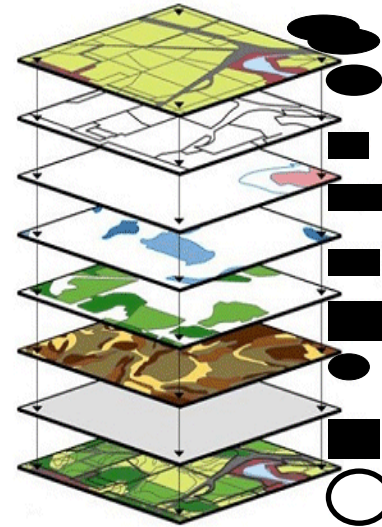
Wildlife Habitat Management Areas

Other Recreation Sites

Roads

Trails

Public Land





# Primary Contact Areas



## Populated Places and Schools

Census Blocks 55 Persons/mi<sup>2</sup>  
Schools

} + 1 Mile

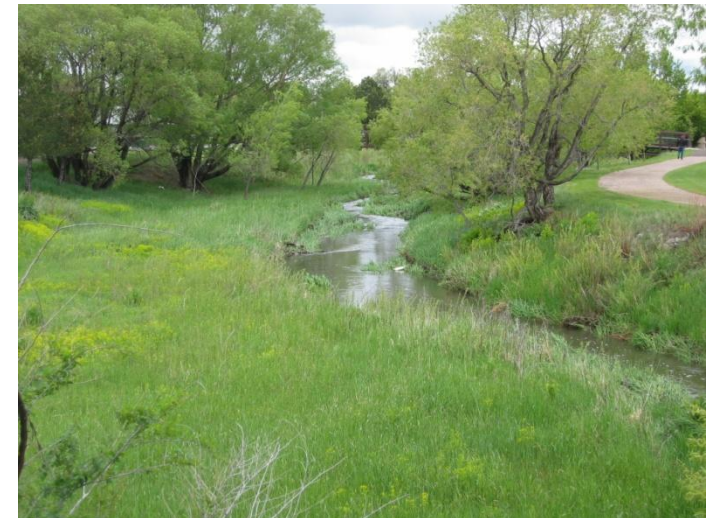


## Established Recreation Areas

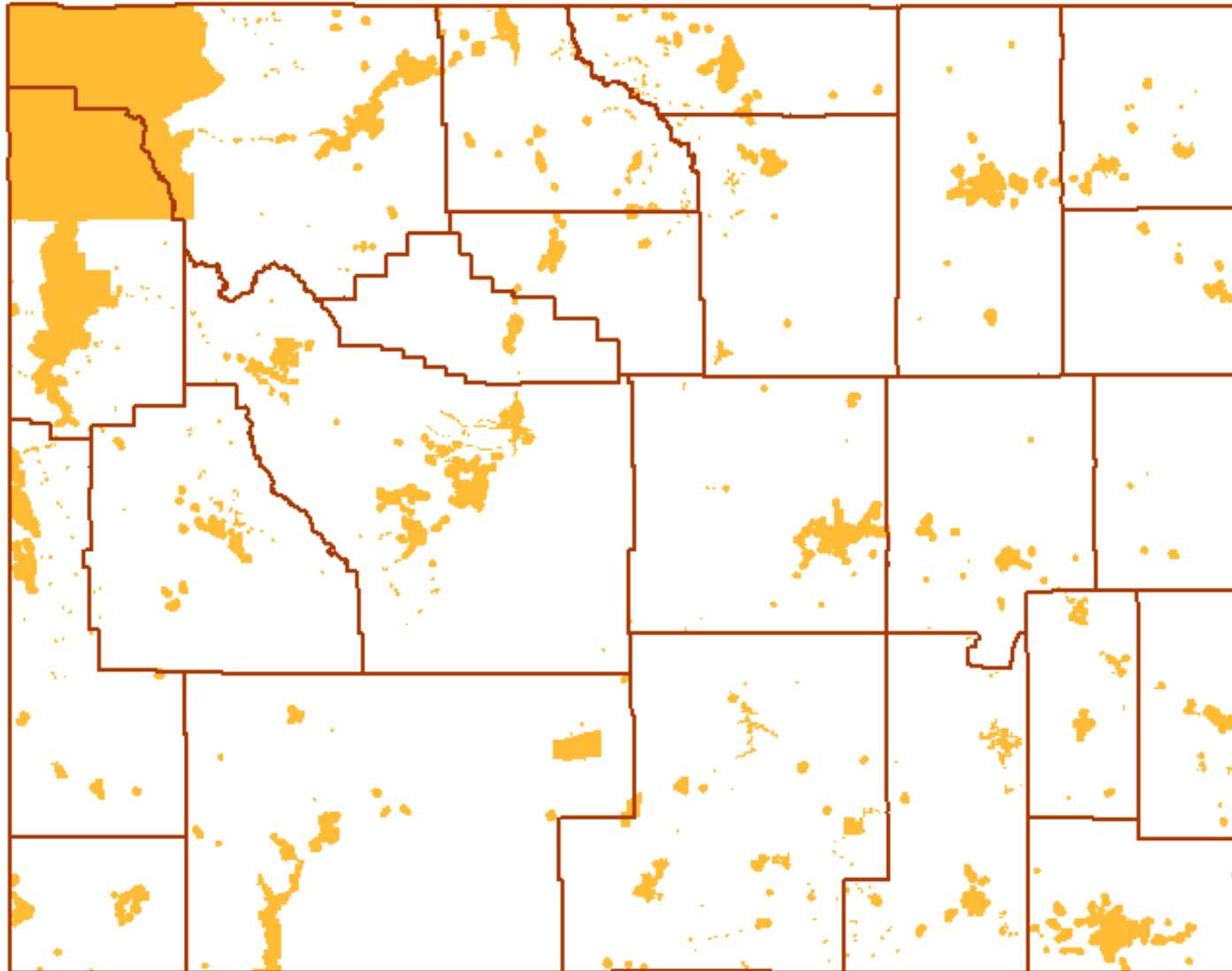
National Parks  
State Parks and Historic Sites  
Wildlife Habitat Management Areas

Campgrounds  
USFS Recreation Sites  
Natural Areas  
WYDot Rest Areas

} + 0.5 Miles



# Primary Contact Areas



Populated Places

Schools

Parks

Recreation Sites



# Weighted Primary Contact Areas



Category	Dataset	Categories or Buffer Distance (miles)	Designation or Weighting
<b>Established Recreation Areas</b>	Campgrounds	1.5	5
		2.5	3
	USFS Recreation Sites, Natural Areas, and WY DOT Rest Areas	1.5	5
		2.5	3
	National Parks, State Parks and Historic Sites, Wildlife Habitat	1	5
		2	3
<b>Other Recreation Areas</b>	Trailheads	0.5	5
		1.5	3
		2.5	1
	Dispersed Campsites	0.5	5
		1.5	3
		2.5	1
<b>Access</b>	Roads	0.25	5
	Trails	0.25	5
	Public Land	Within Boundary	5

Weights  $\geq 12$ : Streams located near recreation sites that may be used for primary contact recreation

# Weighted Primary Contact Areas



Campgrounds

Recreation Sites

Parks

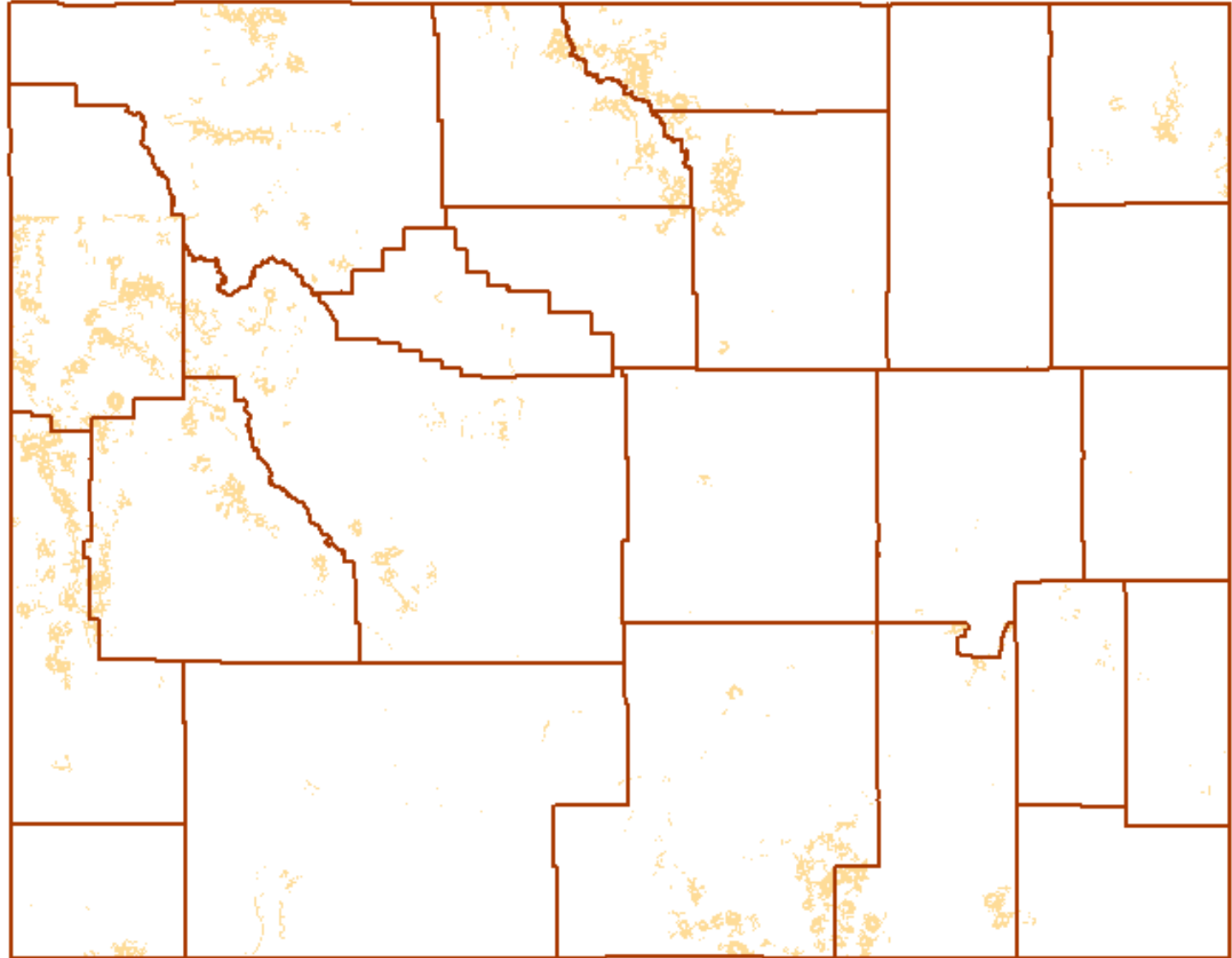
Trailheads

Dispersed  
Campsites

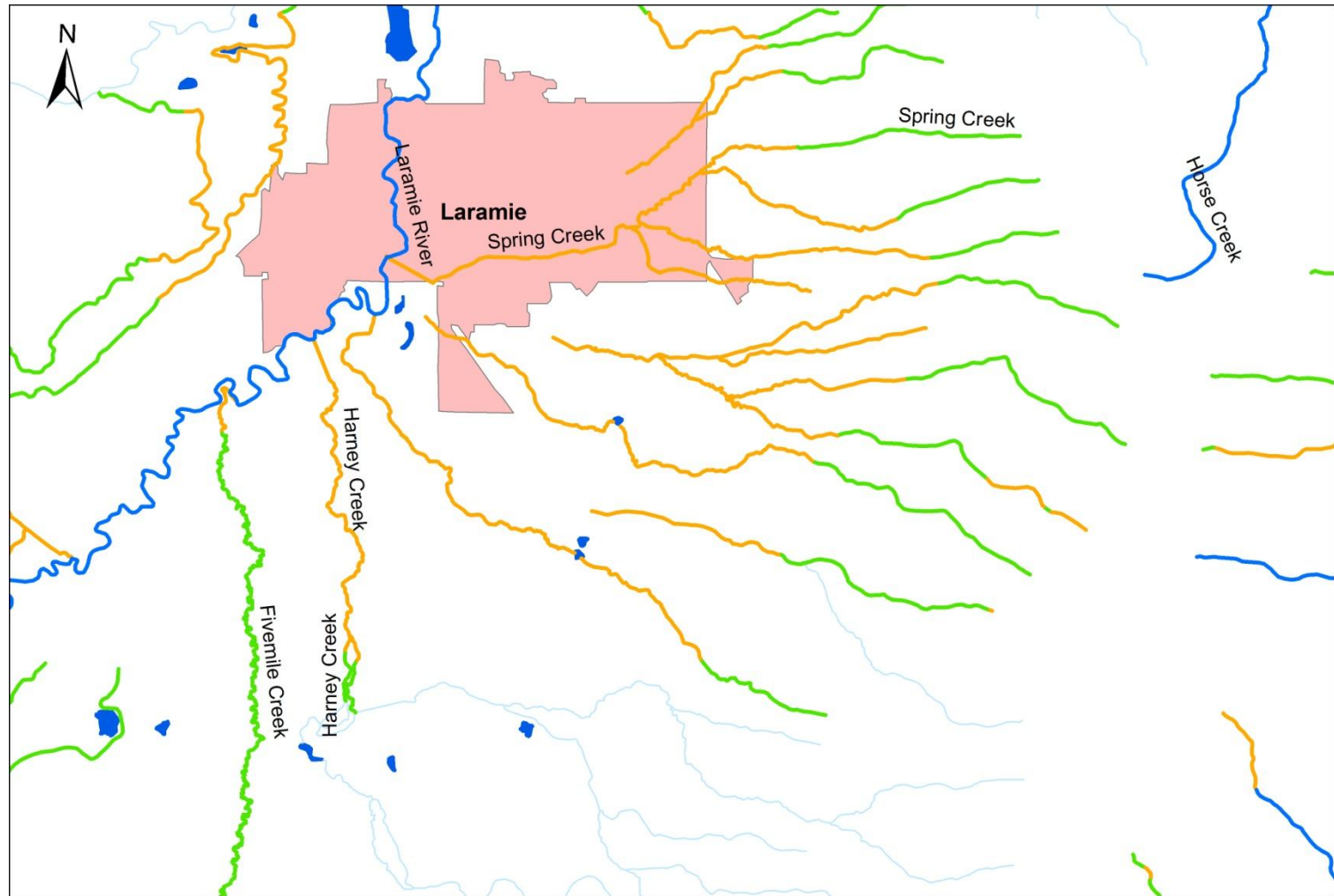
Roads

Trails

Public Land



# Extensions



- Primary Due to Flow
- Primary Due to Access
- Primary Due to Extension
- Secondary
- Town
- 100K Lake/Reservoir

0 0.5 1 2 Miles

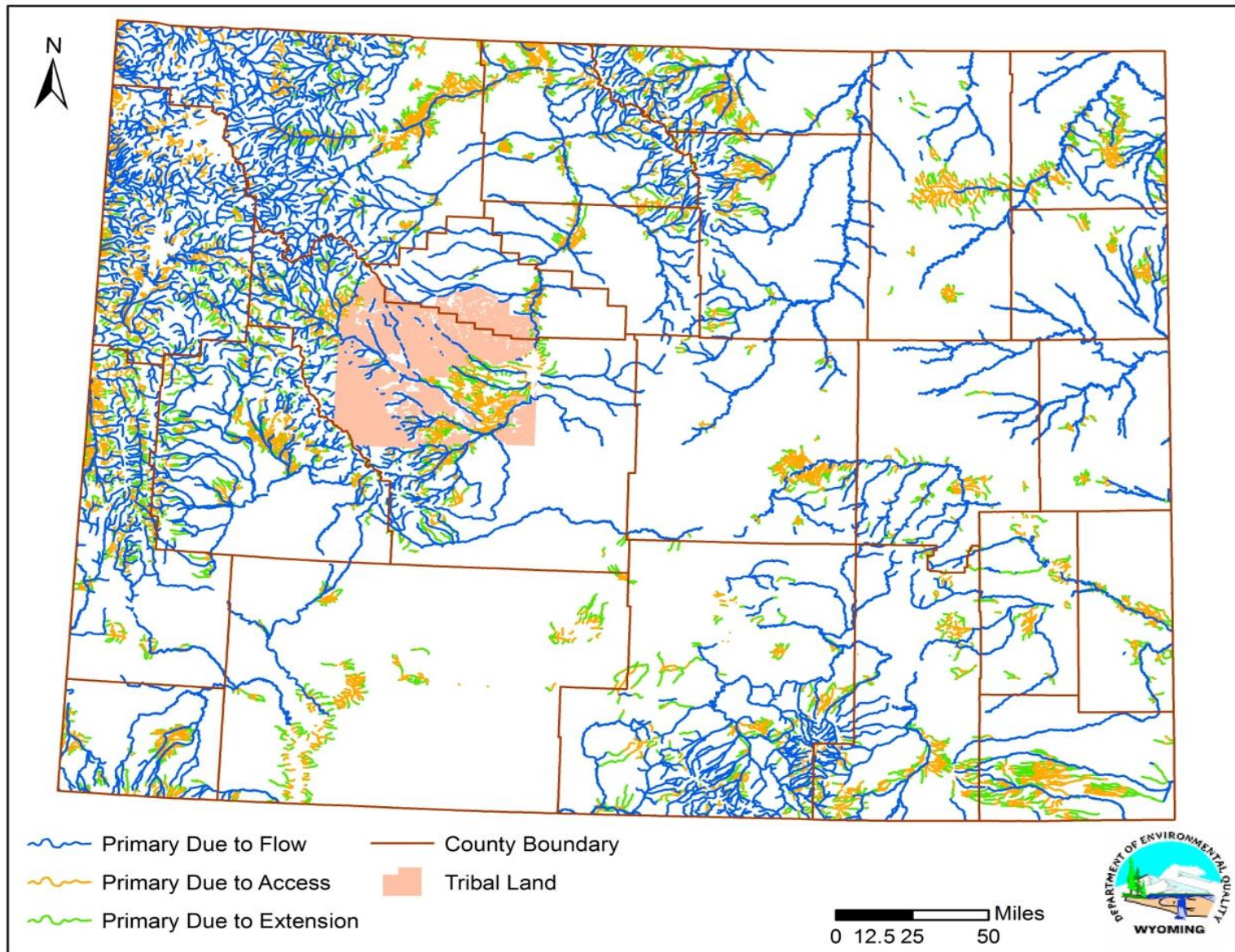
# Weighted Primary Contact Areas



<b>UAA Datasets</b>	<b>Stream Miles</b>	<b>Percent of Stream Miles</b>
Total Non-Tribal 100k NHD Streams	110,790	100.0
Mean Annual Flow $\geq$ 6 cfs	19,718	17.8
Mean Annual Flow $<$ 6 cfs	91,072	82.2
Mean Annual Flow + WYDES $\geq$ 6 cfs	21	0.0
Primary Due to Access	7,298	6.6
Primary Due to Extensions	6,261	5.7
Total Primary Streams	33,276	30.0
Total Secondary Streams	77,514	70.0

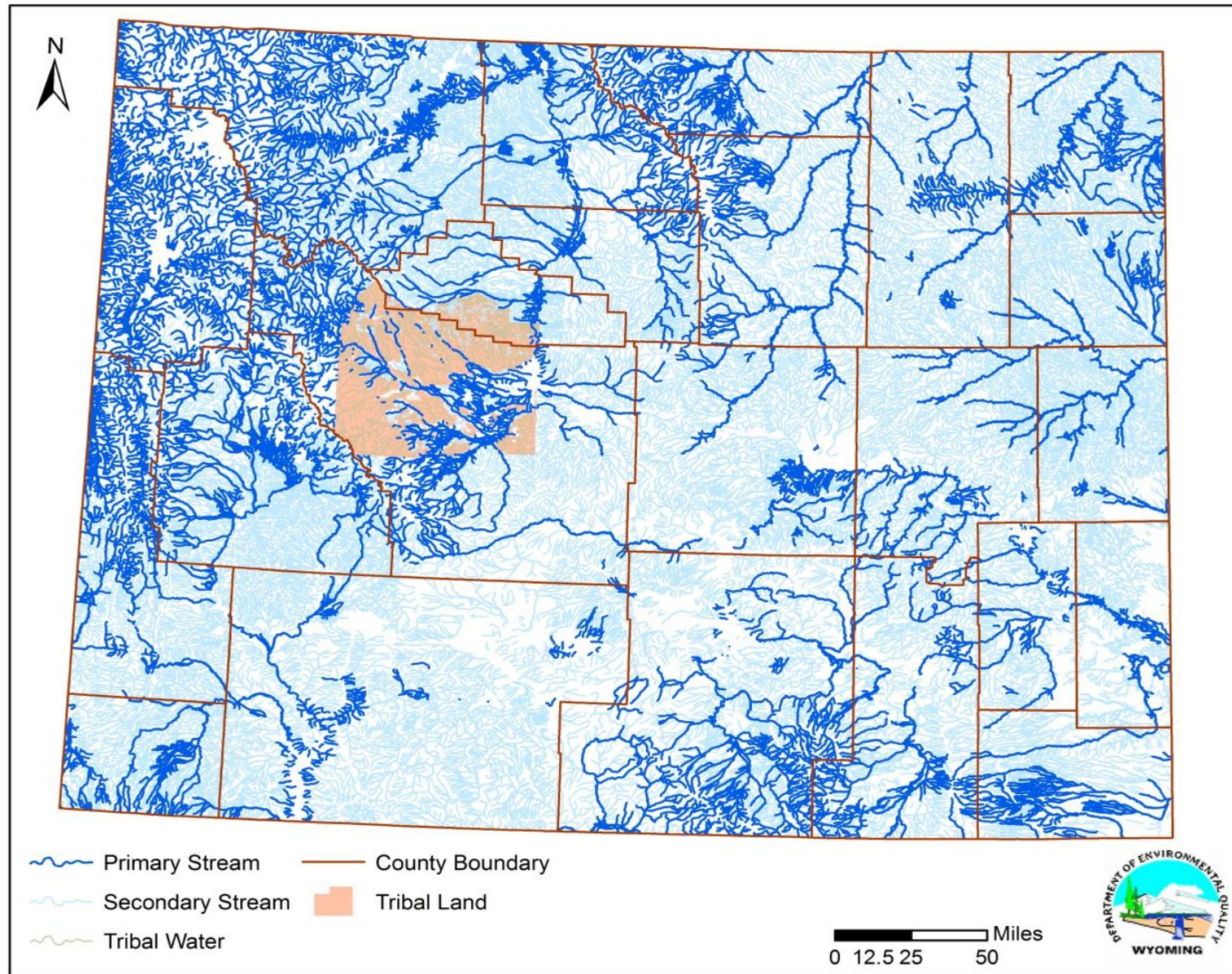


# Results



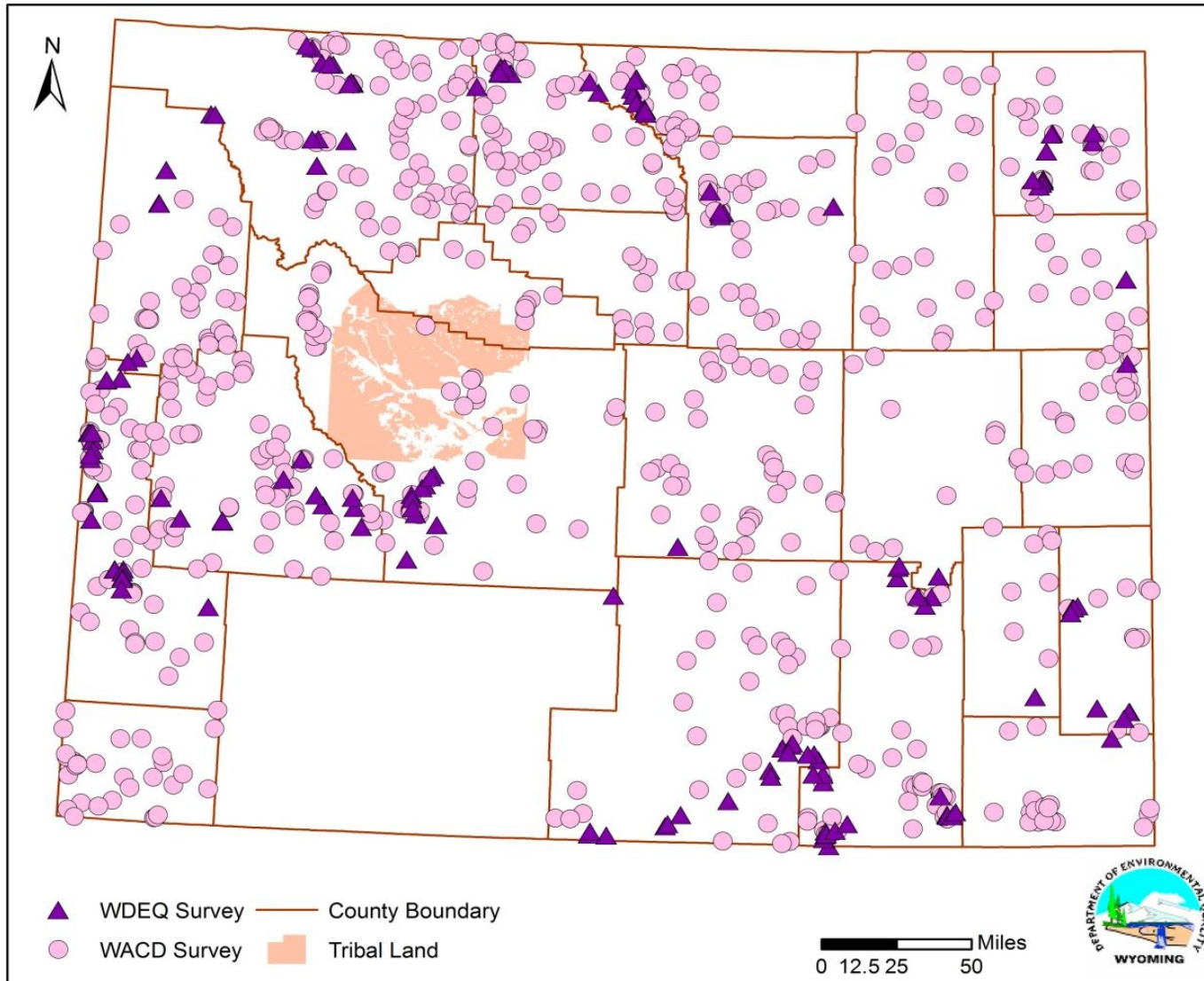


# Results





# WACD and WDEQ Surveys



WDEQ 151 sites  
75 primary  
76 secondary

Primary 98.7 %  
Overall 56.3%

WACD 720 sites  
292 primary  
428 secondary

Primary 91.4%  
Overall 73.5 %



# Web Map



Wyoming Department of Environmental Quality

DEQ-WQD UAA Flex Application

159.238.120.99/DRAFT\_UAA/INDEX.HTML

Free Hotmail Suggested Sites Web Slice Gallery Other bookmarks

Water Quality Division Surface Water Classification  
Draft Recreational Use Attainability Analysis

Information

Legend

UAA Layers

- County Boundary
- Primary Due to Flow
- Primary Due to Access
- Primary Due to Extension

ArcGIS Viewer for Flex

About the UAA Viewer State of Wyoming Disclaimers

Department of Environmental Quality  
WYOMING

**Welcome to the Draft Recreational Use Attainability Analysis Web Map.**

The Recreational Use Attainability Analysis Web Map displays proposed primary and secondary contact recreation designations for 100k streams based on a preliminary draft of the UAA, along with the datasets that were used in the analysis. The viewer also displays 24k primary areas where 24k streams are designated for primary contact recreation. Drafts of the Categorical UAA for Recreation can be obtained from the WDEQ/WQD Surface Water Standards Webpage.

Streams that do not support primary recreation are those that have insufficient flow to support immersion activities (mean annual flow less than 6 cfs) and those that are not located near recreation sites or areas that are easily accessed by children and/or the public. See the table below for datasets used to identify either 24k areas or 100k streams for primary contact recreation. Primary designations in the table were assigned a default weight of 100 in the attribute table for the Primary Streams Due to Access stream layer. Streams and 24k areas with weightings of 12 or more were designated for primary contact recreation. To help eliminate isolated primary streams, primary segments were extended upstream and downstream to the nearest 100k NHD confluence or lake, or upstream to the terminus of the stream. These are displayed in the Primary Due to Extension stream layer.

\* Table of UAA Layers and Values: [UAA Data Table](#)

\* UAA WEB VIEWER: [Instruction Document](#)

This application was developed with ArcGIS Viewer for Flex.

**IMPORTANT WHEN USING OTHER BROWSERS**  
This application is optimized for and was developed for Internet Explorer version 8.0. If you use  
☐ Don't show again

OK Flex Viewer Help WQD Standards Homepage

200 km  
100 mi

start DEQ-WQD UAA Flex ... Search Desktop 7:26 AM

# Specific Feedback

- Where else does primary contact recreation occur? Pools?
- Are any of the datasets inaccurate (locations of schools, trailheads, parks, etc.)?
- General feedback



# Next Steps

- Public Review of UAA
- Incorporate Feedback
- Begin Formal UAA Process:
  - Public Comment
  - If minimal feedback and changes, submit UAA to EPA as revised water quality standards
  - If major revisions, do another public comment period





# Questions/Comments?



Lindsay Patterson

Wyoming Surface Water Quality  
Standards

[Lindsay.Patterson@wyo.gov](mailto:Lindsay.Patterson@wyo.gov)

307-777-7079

